



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
0570315075	10/20/97	STRALSS	D WFO02/4011/2

THOMAS W HUMPHREY
WOOD HERRON & EVANS
2700 CAREW TOWER
CINCINNATI OH 45202

IMS1/1117

EXAMINER

HOBSON/LOAR

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 11/17/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/881,948

Applicant(s)
Strauss et al.

Examiner
Rodney McDonald

Group Art Unit
1753



☒ Responsive to communication(s) filed on Oct 28, 1998

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 9-13, 23, and 24 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 9-13, 23, and 24 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 1753

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 9 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujitsu (Japan 59-179784) in view of Zejda (U.S. Pat. 5,112,467).

Fujitsu teach in a sputtering device for forming thin film on a substrate by applying direct current of high voltage on the target in a magnetron, the target is attached to a water cooling backing plate by screws with a metal sheet between them. (See abstract)(Applies to claims 9 and 23)

Art Unit: 1753

In Figure 2, the target 11 has a generally disk shaped surface having two planar surfaces and a cylindrical outer periphery manufactured of sputtering material. The target has at least one radially-inward step proximate the outer periphery as seen in Figure 2. The target is manufactured of a single material. Holes are provided in proximity to the targets outer periphery to allow screws to attach the target to the backing plate. (See Figure 2)(Applies to claims 9 and 23)

The differences between Fujitsu and the present claims is that the threaded holes in the target are not discussed.

Zejda teach a cathode sputtering apparatus provided with a quick disconnect mechanism for rapid replacement of a target. (See Abstract)(Applies to claims 9 and 23)

In Fig. 1 there is illustrated an upper portion 19 of a cathode chamber on which is received an annular target unit. As illustrated, the target unit comprises a target 1 and a target base plate 2, the base plate 2 serving as a target holder. (Column 2 lines 59-65)(Applies to claims 9 and 23)

The target 1 and base plate 2 are secured together by means of screw bolts 14. The upper portion 19 essentially comprises the cover of the cathode chamber. (Column 2 lines 66-68) From Fig. 1 threaded holes are provided in order for the threaded screw to secure the target to the holder. (See Fig. 1)(Applies to claims 9 and 23)

The motivation for utilizing screws to secure a target is that it is desired to provide a target with rapid replacement. (See Abstract)

Art Unit: 1753

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a target having a generally disk-shaped section having two generally planar surface and an outer periphery, the generally disk-shaped section having at least one radially-inward step proximate the outer periphery, manufactured out of a single material, and providing holes in the outer periphery of the target as taught by Fujitsu and to have provided threaded holes in a target so screws can secure the target to a holder as taught by Zejda because it is desired to provide a target which can be replaced rapidly.

3. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujitsu in view of Zejda as applied to claims 9 and 23 above, and further in view of Inoue (U.S. Pat. 5,244,556).

The differences not yet discussed is exposing one side of the target to vacuum pressure while the other side is not exposed to vacuum pressure and the materials of the sputtering target.

Inoue teach in Fig. 2 an example of target in which solder, a brazing filler metal having a low melting point is not used. Referring to Fig. 2, the target plate 31 is directly mounted on the flange 3a of the support frame 3b by respective screws 17a and 17b via the sealing member 4 (the O-ring). Thus, the target plate 31 is directly cooled by cooling water (the heat exchanging medium). (Column 2 lines 31-37)(Applies to claims 10-13)

Inoue also suggest that target materials for a target can be aluminum, one of the metals titanium, zirconium, tungsten, molybdenum, gold, tantalum, niobium, palladium, manganese, silver, zinc, ruthenium, and tellurium, an alloy in which at least one of the above metals is the chief

Art Unit: 1753

ingredient, chromium, nickel, a chromium alloy, a nickel alloy, magnetic metals such as permalloy, a silicon alloy of one of the metals titanium, tungsten and molybdenum, silicon, and an oxide of any of the above materials. (Column 7 lines 62-68; Column 8 lines 1-5)(Applies to claims 10-13)

The motivation for exposing one side of the target to vacuum pressure and the other side not being exposed to vacuum pressure is that it is desired to directly cool the target and the motivation for forming a target out of different materials is that it is desired to sputter different materials on a substrate. (Column 2 lines 31-37; Column 7 lines 62-68; Column 8 lines 1-5)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to expose one side of a target to a vacuum while the other side is not exposed to a vacuum and to have made a target out of different materials as taught by Inoue because it is desired to cool a target and deposit different materials on a substrate.

4. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujitsu in view of Zejda as applied to claims 9 and 23 above, and further in view of Wegmann et al. (GB 2,173,217).

The differences not yet discussed is two radially inward steps in the target.

Wegmann teach in Fig. 5 a target plate 1 having on its outer periphery a cooling lip 12 with which may be associated holding means. Additionally are provided further cooled clamping rings 14 of a smaller diameter the cooling surfaces of which bear onto a cooling rib 15 on the lower side of the target plate 1. (Page 2 lines 52-61)(Applies to claim 24)

The motivation for providing two stepped surfaces on a target surface is that it is desired to cool the target. (Page 2 lines 52-61)

Art Unit: 1753

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided two stepped surfaces as taught by Wegmann et al. because it is desired to cool the target.

Response to Arguments

5. Applicant's arguments filed 10-28-98 have been fully considered but they are not persuasive.

ARGUMENTS TO THE 35 U.S.C. 103 REJECTIONS:

It is argued that Fujitsu does not teach threaded holes in their target but the holes in Fujitsu's target should not be threaded because as doing so would make it much more difficult to achieve tight mechanical engagement. It is argued that Zejda does not provide the proper motivation to put threaded holes in Fujitsu's target because doing so would be counter-productive. It is argued that since Zejda and Fujitsu teach devices that are radically different in application (i.e. magnetron vs. nonmagnetron) and these applications have a profound impact on the positioning and manner of use of the target mounting bolts that there is no rational that the references should be combined. It is argued that Inoue teaches away from using a single material target. It is argued that Wegmann does not show the concepts absent from Fujitsu, Zejda, or Inoue.

RESPONSE TO THE ARGUMENTS OF THE 35 U.S.C. 103 REJECTIONS:

Applicant alleges that tight mechanical engagement cannot be achieved if threaded holes are provided in Fujitsu's target, however, it is argued that providing threaded holes can still

Art Unit: 1753

achieve a tight mechanical fit if screwed properly. It is argued that Zejda does teach that the motivation for providing threaded holes in a target allows for attachment and detachment of the target to a backing plate for rapid replacement. It is argued that the sputtering targets of Zejda and Fujitsu can be utilized for both magnetron and non-magnetron sputtering. Zejda simply suggests threaded holes for securing a target to a backing to allow for rapid replacement of a target. It is argued that Inoue suggest materials of targets and exposing one side of a target to vacuum pressure while the other is not exposed to vacuum pressure. Fujitsu was relied upon to suggest a single material target. It is argued that the combination of Fujitsu, Zejda, Inoue and Wegmann do suggest the claimed subject matter as discussed above. (See Fujitsu, Zejda, Inoue and Wegmann discussed above)

Conclusion


6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1753

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney McDonald whose telephone number is (703) 308-3807.



NAM NGUYEN
PRIMARY EXAMINER
GROUP 1100

RM

November 17, 1998